



Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

August 8, 2011

CIRCULAR LETTER 2011-11

PRECAST CONCRETE BRIDGE SLABS

COUNTY ENGINEERS/SUPERINTENDENTS OF HIGHWAYS
MUNICIPAL ENGINEERS/DIRECTORS OF PUBLIC WORKS
CONSULTING ENGINEERS

This Circular Letter implements new policies regarding the use of precast concrete bridge slabs. These slabs are often referred to as channel beams or by their proprietary name – “Nelsen” or “Midwest” beams.

This beam type has demonstrated a poor performance on routes with higher ADTs and salt applications, and as with other structure types is also heavily dependent on quality of fabrication. As better performing structure types are available, they are no longer permitted on state and federal routes. However, these structures may still be appropriate and cost-effective on some local agency structures.

Since precast concrete bridge slabs are a proprietary product, the department does not maintain design policies, base sheets or details for these products. Historically, designers have used details and designs supplied by proprietary companies, but these companies no longer exist. Consequently, when owners elect to use these products, the design and detail of these members must be provided by an Illinois Licensed Structural Engineer and must satisfy the AASHTO LRFD Bridge Design Specifications. In addition, epoxy coated reinforcement should be used in these members.

In the past (over 30 years ago) the department approved certain tack welding locations on reinforcement to assist with fabrication. The department now believes proper tying of the reinforcement supplemented with auxiliary reinforcement, if necessary, is sufficient for securing the reinforcement cages. All previous approvals of tack welding for precast concrete bridge slabs are rescinded for both black and epoxy coated reinforcement applications.

The methods used to develop the main reinforcement in the legs of precast bridge slabs have also been an issue of concern. The development of strength bars in the bottom legs of these units should be accomplished by either development hooks or by proprietary systems such as threaded common end plate(s). On slabs with more than one layer of primary reinforcement, reinforcement congestion can be alleviated by staggering the hooks on the top and bottom layer as provided by the structural engineer.

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Section 1042.03 of the *Standard Specifications for Road and Bridge Construction* provides construction requirements for precast concrete structural members. However, past performance indicates more stringent criteria are necessary for precast concrete bridge slabs. Until such time as the specification is revised, the following notes should be included on plans for precast concrete bridge slabs:

1. "The units shall remain on the bottom supporting forms until the concrete has attained a compressive strength of not less than 3,500 pounds per square inch."
2. "The surface of the member shall not deviate more than 1/1200 of the full length of the member from a straight line connecting the two end points on the member's surface. Prior to erection, the beams shall be tested and approved by the resident engineer at the jobsite."

If you have any questions regarding this Circular Letter, please contact Jack Elston at (217) 785-8748 or jack.elston@illinois.gov.

Sincerely,



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